



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/397,850	09/17/1999	ARLIN R. DAVIS	219.37206X00	9295

20457 7590 06/05/2003

ANTONELLI TERRY STOUT AND KRAUS
SUITE 1800
1300 NORTH SEVENTEENTH STREET
ARLINGTON, VA 22209

EXAMINER

BURGESS, BARBARA N

ART UNIT	PAPER NUMBER
----------	--------------

2157

DATE MAILED: 06/05/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/397,850

Applicant(s)

DAVIS, ARLIN R.

Examiner

Barbara N Burgess

Art Unit

2157

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This is in response to applicant's amendment filed on March 17, 2003. Claims 1-24 are presented for further examination.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 9-10, and 17-18 are rejected under 35 U.S.C. 103(a) as being anticipated by Schwab.

As per claims 1, 9, and 17, Schwab discloses a method of reading data from a remote memory of a remote device to a local memory of a local device across a network, method comprising:

- Sending a message from the local device to the remote device, via the network, said message including a transport header indicating a message type (column 2, lines 3-10, column 3, lines 21-22, column 4, lines 9-10, 21-23, column 6, lines 48-50, 59-62, column 7, lines 3-4, column 8, lines 2-3, Figure 2);

Art Unit: 2157

- Determining, at the remote device, if the transport header of said message identifies the message as a remote Direct Memory Access read operation (column 3, lines 25-27, 31-36, column 6, lines 48-68, column 7, lines 40-50, column 8, lines 1-5).
- If the transport header of said message identifies the message as said remote Direct Memory Access read operation, then performing a remote Direct Memory Access write operation at the local device in accordance to data elements included in said message (column 4, lines 46-63, column 6, lines 48-68, column 7, lines 15-25, 40-64, column 8, lines 1-5).

As per claims 2, 10, and 18, Schwab further discloses:

- Data elements in said rDMA read message identify a set of source buffers in the remote device which reference the remote host-side memory and a set of destination buffers in the local device that reference the local memory (column 6, lines 47-68, column 7, lines 44-64, column 8, lines 1-12, 14-30, 33-49).

3. Claims 3-4, 11-12, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwab in view of Osborne.

As per claims 3, 11, and 19, the teachings of Schwab does not explicitly disclose the source and destination buffers being registered with a Virtual Interface network interface controller of the remote and local device.

However, the teachings of Osborne disclose receiving a virtual address from a controller in the network interface and determining the physical address based on the virtual address (column 1, lines 65-67, column 2, lines 29-31, column 8, lines 16-20, 48-50, 52-54). Therefore, Osborne implicitly discloses source and destination buffers being registered with the Virtual Interface network interface controller.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate a Virtual Interface network interface controller in Schwab's method to ensure appropriate data transfer protection and reduce the interaction of the operating system, which in turn conserves host processing cycles enabling an increase in the number of cycles available to application programs while decreasing the overall time it takes to receive messages.

As per claims 4, 12, and 20, Osborne further discloses data elements of the rDMA read message specifying the source buffers and destination buffers as multiple data segments with offsets and designating a channel of the Virtual Interface (VI) as a data path for the rDMA write operation (column 7, lines 7-9, column 8, lines 37-39, column 9, lines 44-55, column 11, lines 12-15, 36-37, column 13, lines 30-32, column 22, lines 48-49).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate the use of data segments with offsets and a channel of the Virtual Interface as the data path in Schwab's method to ensure appropriate data transfer protection and reduce the interaction of the operating

Art Unit: 2157

system, which in turn conserves host processing cycles enabling an increase in the number of cycles available to application programs while decreasing the overall time it takes to receive messages.

4. Claims 5-6, 13-14, and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwab in view of Osborne and in further view of Krishnan et al. (hereinafter "Krishnan", 4,922,416).

As per claims 5, 13, and 21, the combined teachings of Schwab and Osborne does not explicitly disclose a data element of the rDMA read message specifying a last data segment and completion of the rDMA read request.

However, in an analogous art, Krishnan discloses an end of message signal that indicates the completion of a process or data transfer (column 1, lines 31-33, 42-46, column 4, lines 48-50, 53-55, column 5, lines 36-38, column 7, lines 8-10, column 8, lines 10-12). Therefore, Krishnan implicitly discloses a data element of the rDMA read message specifying a last data segment and completion of the rDMA read request.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate a data element specifying the completion of a rDMA read request in Schwab's, in view Osborne, method in order for a data process or transfer to be completed quickly and efficiently by enabling other read/write requests to be executed.

Art Unit: 2157

As per claim 6, 14, and 22, the teachings of Schwab does not explicitly disclose data is read directly from the remote memory of the remote device into the local memory of the local device over a Virtual Interface (VI) without making an intermediate copy. However, this feature is evidenced in the teachings of Osborne (column 1, lines 40-42, 67, column 2, lines 1, 22-25, 42-45, 55-61).

Therefore, one of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate reading data directly from the remote memory into the local memory in Schwab's method in order to conserve host processing cycles, increase the number of cycles available to application programs, and decrease the delay in receiving messages.

5. Claims 7-8, 15-16, and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwab in view of Osborne and in further view of Krishnan et al. (hereinafter "Krishnan", 4,922,416) and in further view of Chow et al (hereinafter "Chow", 6,052,387).

As per claims 7, 15, and 23, the combined teaching of Schwab, Osborne, and Krishnan does not explicitly disclose write descriptors with a sequence inserted into the immediate data field on the last segment of each request.

However, in an analogous art, Chow discloses a last buffer bit, one field of the buffer descriptor, that indicates that the buffer descriptor is the last one of the linked list and thus the end of the data (column 4, lines 26-27, 38-40, 44-46, column 6, lines 39-

Art Unit: 2157

41, column 8, lines 56-60, column 8, lines 12-16, column 9, lines 19-21, 25-26, 29-30).

Therefore, Chow implicitly discloses write descriptors with a sequence inserted into the immediate data field on the last segment of each request.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate the use of descriptors with the sequence inserted into the immediate data field on the last segment of each request in Schwab's method in order to determine the end of a data to be read or written thereby decreasing the time it takes to read or write data and reducing the delay in data transfer.

As per claims 8, 16, and 24, the combined teachings of Schwab and Osborne does not explicitly disclose the completion of data transfer is based on the immediate data that arrives with the last data segments of each write operation.

However, in an analogous art, Chow discloses a last buffer bit, one field of the buffer descriptor, that indicates that the buffer descriptor is the last one of the linked list and thus the end of the data process (column 4, lines 26-27, 38-40, 44-46, column 6, lines 39-41, column 8, lines 56-60, column 8, lines 12-16, column 9, lines 19-21, 25-26, 29-30). Therefore, Chow implicitly discloses the completion of data transfer is based on the immediate data that arrives with the last data segments of each write operation.

One of ordinary skill in the art at the time the invention was made would have found it obvious to implement or incorporate completion of the data transfer is based on the immediate data that arrives with the last data segments of each write operation in

Art Unit: 2157

Schwab's method in order to determine the end of the written or read data thereby decreasing the time it takes to read or write data and reducing the delay in data transfer.

Response to Arguments

The Office notes the following arguments:

- (a) There is no disclosure anywhere in Schwab of Applicant's reading data from a remote memory of a remote device to a local memory of a local device, via a network, as expressly defined in each of Applicant's independent claims 1, 9, and 17.
- (b) There is no disclosure anywhere from Scwab of Applicant's exchange of data message between a local device and a remote device, via a network, and that the data message contains a transport header used to indicate a message type, i.e., a remote Direct Memory Access (rDMA) read operation so that a remote Direct Memory Access (rDMA) write operation can be performed in the manner defined in each of Applicant's independent claims 1, 9, and 17.
- (c) Examiner has failed to provide any suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Kinoshita into Schwab in order to arrive at Applicant's claims 1-2, 9-10, and 17-18.
- (d) Examiner has not indicated which Osborne reference is used to support the rejection of claims 3-4, 11-12, and 19-20. Clarification is respectfully requested.

Art Unit: 2157

6. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

In response to:

(a) Schwab discloses sending messages between two processors in a multiprocessing system. These processors can be located anywhere with respect to each other. Specifically, the reference discloses the system used in a telephone network environment where customers are located in different places (column 3, lines 50-67, column 4, lines 1-20). Therefore, Schwab does disclose reading data from a remote memory of a remote device to a local memory of a local device, via a network.

(b) Schwab discloses determining whether the message is a read or write operation and performing the necessary process of transferring data (column 6, lines 47-67, column 7, lines 1-25, 37-50, column 8, lines 1-7). Therefore, Schwab indeed discloses exchange of data message between a local device and a remote device, via a network, and that the data message contains a transport header used to indicate a message type, i.e., a remote Direct Memory Access (rDMA) read operation so that a remote Direct Memory Access (rDMA) write operation can be performed.

(c) Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

- (d) The referenced used in this rejection is Osborne (US Patent 6,078,733).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,093,780

U.S. Patent No. 5,909,546

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

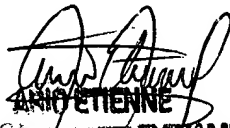
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara N Burgess whose telephone number is (703) 305-3366. The examiner can normally be reached on M-F (8:00am-4:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Ettinene can be reached on (703) 308-7562.. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7240 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Barbara N Burgess
Examiner
Art Unit 2153

May 30, 2003


ARIO ETIENNE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100